

American Journal of Nursing Research, 2014, Vol. 2, No. 1, 1-6

Available online at <http://pubs.sciepub.com/ajnr/2/1/1>

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DOI:10.12691/ajnr-2-1-1

Review of the Characteristics of Mothers Donor Milk Banks

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Received May 23, 2013; Revised November 02, 2013; Accepted January 12, 2014

Abstract With this paper we aim to understand the motivations that lead women to donate their milk to milk banks. We've made an integrative review using articles collected from PubMed, considering as an inclusive criteria they having defined as an object of study social or motivational aspects of the mothers that have donated milk; we found and analyzed eight articles. There is great variability in the sociodemographic characteristics of the mothers. The main motivations for donating are an altruistic feeling and an excess of milk, being important training and informing health professional surrounding the birth process as well as social and familiar support and institutional involvement accompanied by a collection infrastructure to facilitate the convenience of the mothers in the donation.

Keywords: *Human milk banks, breastfeeding, motivation, donors, wet nurse*

Cite This Article: Martínez-Sabater A., Siles-González J, Escrivá-Aparisi MV, and Ballestar-Tarín ML, "Review of the Characteristics of Mothers Donor Milk Banks." *American Journal of Nursing Research* 2, no. 1 (2014): 1-6. doi: 10.12691/ajnr-2-1-1.

1. Introduction

Between the nineteenth and twentieth century there has been a change in the process of infant feeding when using the so called "infant formulas" started to be standardized and breast feeding rates decreased influenced, among other reasons, by improvements in scientific development and its applications to industrial, chemical and pharmaceutical industries and the emergence of "artificial milk". This means a change in eating habits that has being sponsored by the economic interests of industry and the belief of the professionals about the benefits of artificial nutrition accompanied by social changes as the process of women liberation that joined the labor market and sees artificial feeding as a symbol of modernity and an improvement in the gender perspective [1]. The motivations built on values, social structures like family and the feelings that encourage mothers to give their milk to their children have undergone a transitions process through which they will be replaced by new values, substantially different structures and, finally, new values and feelings that are the foundations for a new kind of motivations.

On these premises we considered, on one hand, the analysis of the transitions from a traditional natural aesthetic, motivating natural milk feeding (preferably breast feeding), built on values and feelings inspired by motherhood and family to an industrial aesthetic that promotes artificial milk in which the motivation is based on the values and feelings of professionalism and technologicism, and on the other hand describe and

analyze the passage of the industrial aesthetic postulator of infant formulas based on values and feelings as professionalism and technologicism to an aesthetic promoting women natural milk inspired by values such as transmaternal solidarity and the institution of motivations that drive women to donate their breast milk to Natural Milk Banks for other women to feed their children with it. Based on these objectives arise our research questions which could be summarized in knowing what kind of motivations determine the practice of maternal breastfeeding, the use of infant formulas and, finally, breastfeeding through the system of donations in milk banks and if there is a transition process in motivations, values and feelings that determine the different types of feeding in infants: maternal breastfeeding, bottle feeding and breastfeeding through the milk donation banks system and we aim to know what motivations lead women to donate their milk to milk banks.

2. Main Text

2.1. Status of the Question

It's well known the importance of breast milk for growing, development and healthy conditions in general children being of special importance for premature, low birth weight or vulnerable babies. WHO recommended, in situations where children cannot receive milk from their mothers that the best option is donated milk [2]. And the end of nineteenth century began a change in infant feeding, from breastfeeding to feeding formulas which will have health implications such as an increased rate of infections,

and at the same time will produce social change such as the lost of intergenerational culture of breastfeeding and that allowed the abandonment of breastfeeding as symbol of modernity [1]. Traditionally Family has being the social institution responsible for the health care of its members, being mainly women responsible for dealing with nursing care, breeding, etc. However, throughout history there have been situations in different regions historical periods and cultures in which mothers have delegated the lactations process in nurses, a situation that has been usual in the historical process of infant care as it is the use of infant formula [3]. Historically nurses have been a landmark in social development appearing dispositions about them in different historical moments [4,5,6]. The attempt to build a vision of a “new mother” led to a negative view of the nurses by society, and in combination with the development of feeding formulas, facilitated the disappearance of this figure influencing the pattern of mortality in children [7].

Given the difficulty of ensuring through nurses breastfeeding to sick or premature children who required feeding that could not be fulfilled by artificial milk was created in Vienna in 1909 the first milk bank [8]. In 1949 was emphasized the importance and great value of milk banks for the recovery of premature infants as well as those with an infectious disease [9], considering this as a medicalized version of nurses and demonstrating its effectiveness on the survival of premature infants and of

those in critic state, being recognized the benefits of donated milk and the requirements to keep on the maintenance and distribution process [10]. Despite this, the introduction of milk banking has had an uneven development in different countries depending on the characteristics of public health policies, highlighting the example of Brazil with the growth of donation and milk banks based in government support that has been linked to a drop in infant mortality rates [11,12], while in Spain in 2010 there were only two Milk Banks [13]. Some authors recognize the importance of milk banking as a fundamental right since it has been proved that in those places where, donor milk banking is protected, promoted, and supported as an extension of national breastfeeding policies, milk banking is considered a reasonable and effective part of health care delivery for infants and children [14].

2.2. Methods

Although initially we considered conducting a systematic review of the topic to get scientific evidence, due to the lack of published articles that met the inclusion criteria, their methodological characteristics and their different objectives (Table 1) these have affected our decision to conduct an integrative revision to answer the research question.

Table 1. Methodology of the studies

Year. Author	Coun-try	Sam-ple size	Type of study	Assesment
1995. Ighogboja I, Olarewaju R, Odumodu C, Okuonghae	Jos (Nige-ria)	680	Descriptive study	To assess the willingness of the mothers to donate their milk, and to accept donated milk from other mothers
2003. Azema MA, Callahan S.	France	103	Cross-sectional questionnaire descriptive study	Socio-demographic variables; motivations and influences.
2006. Gimeniz Galvao M.T, Gonçalves Vasconcelos S, de Sousa Pavia, S	Fortaleza (Brazil)	11	Descriptive study with a qualitative approach, semistructured interview.	Socio-demographic variables and identification of the motivations for donating
2007.Osbaldiston R. y Mingle L.A	Austin EEUU	87 donors and 19 no donors (control)	Case-control study.	Demographic information and lifestyle. Motivations and problems for the donors. Personal values.
2008. Pimenteira et al	Ala-goas (Brasil)	737	Descriptive study	Socio-demographic variables, motivations and influences.
2009. Talita Dos Santos, Danielle	Lon-drina Paraná. Brasil	91	Cross-sectional study using a questionnaire	Socio-economic profile of the donors.
2010. Estévez de Alencar L.C Fleury Seidi EM	Brasil	36	Exploratory, descriptive, cross-sectional study based on semi-structured home interviews	Motivations

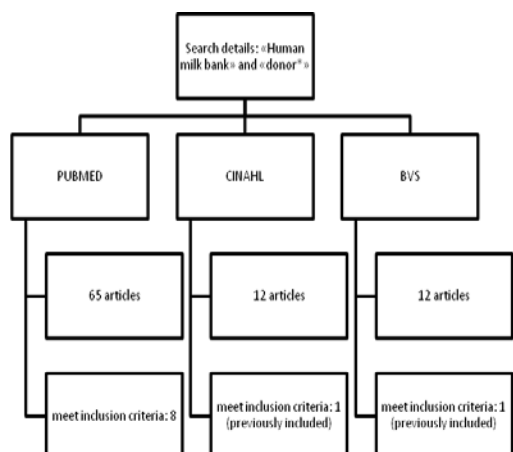


Figure 1. Search Details

To answer our research question we decided to do an integrative research of the literature performing a literature search (searching strategy “donors” and “Human Milk Bank”) on the PubMed Data Base, CINAHL and VHL with an active limit for “Human” appearing respectively 65, 12 and 12 items (Figure 1). We established as an inclusion criterion the assessment in those studies of social and motivational aspects of mothers that donated milk to milk banks excluding the others. We reviewed the abstracts and recovered altogether seven articles (10.73% of the total we’ve found) that met the inclusion criteria (all of them were in the PUBMED Data Base and one of them also found in the others databases mentioned). From the analysis of the articles we have assessed the methodological characteristics of the studies and the results obtained using a content analysis and the interpretation of the reviewed articles, in which we have

tried to extract the methodology that has been used, the object population, socioeconomic characteristics of the mothers, motivations and attitudes toward donations and possible factors affecting positively or negatively to the donation.

Table 2. Socio-economic aspects

Place	Social and economical aspects
1995 Jos (Nigeria)	Education: (13% with no education, 28% Primary, 39% secondary, 20% higher) Religion (64% Christian, 26% Muslim) Employment (56% employed, 44% unemployed)
2003 Francia	Average age: 30.6 years old (20-42) Status (69.9%) married, (27.2%) in a relationship, 2.9% (single) Children. (46.6%) primiparous mothers, (35.9%) second child, (13.6%) third child, 3.9% (fourth child) Employment (51.5%) full time.
2006 Fortaleza (Brazil)	Age: (54.5%) 16-20, (36.4%) 21-30, (9.1%) 31-40 Marital status: (90.9%) Married, (9.1%) Single. Employment: (45.5%) Employed, (27.3%) Housewife, (18.1%) Student, (9.1%) Unemployed. Studies: (36.4%) Basic incomplete (18.2%) Basic (18.2%) Intermediate incomplete (18.2%) Intermediate, (9.1%) Graduate
2007 Austin (EEUU)	Age of the donors. 18% (25-29), 48% (30-34), 25% (35-39) Education: 17% (basic), 53% (intermediate), 30% (graduated). Employment status: 40% (full time job), 25% (part time job), 35% (unemployed). Income: 20% (less than 50,000 \$), 23% (50-75,000 \$), 41% (over 75,000 \$) Marital status: 91% married, 9% single
2008 Alagoas (Brasil)	Age: (18.3%) Under 18, (41.5%) 18 to 24, (36.8%) 25 to 35, (3.4%) Over 35 Marital status: (35%) Married, (53.6%) Single, (0.4%) Divorced, (10.9%) Other Academic level: (7.7%) uneducated, (77.3%) primary, (7.5%) secondary, (7.5%) Higher Employed: (30.1%) Yes, (69.9%) No Number of pregnancies: (87.8%) 1 to 3, (9.6%) 4 to 7, (2.6%) Over 8 Experience as donor: (8.6%) Yes, (91.4%) No
2009 Londrina (Paraná) Brasil	Age: (11%) Between 14 and 18 years old, (20.9%) Between 19 and 23 years old, (28.6%) Between 24 and 28 years old (12.1%) Between 34 and 38 years old (3.3%) Older. Formation level: (8.8%) Illiterate, (19.8%) basic, (41.8%) Intermediate (29.7%) Superior Economic level (2.2%) A1, (14.3%) A2, (15.4%) B1, (22%) B2, (33%) C, (13.2%) D+ E Number of children: 56% Primiparous
2010 Brasil	Age: (24.78 ±5.22) Frequency of extraction: (72.2%) More than once a day, (8.3%) Once a day, (19.4%) variable

Table 3. Related aspects to the process of donating

Place	Donation Process
1995 Jos (Nigeria)	60% Would agree to donate milk. 70% Would not accept donations. Reasons: (28%) Fear of disease transmission, (22%) Fear of transfer of genetic traits, (10%) Lack of hygiene, (10%) Dislike, (9%) Culturally unacceptable practice, (6%) Negative influence, (5%) Religious beliefs, (9%) Does not answer. Reasons for not using the milk extracted. (46%) Chance of contamination. (37%) Spoilage of the milk. (14%) Unsafe practice. (13%) Uncertainty
2003 Francia	(52.4%) First experience of breastfeeding... Valuation of the breastfeeding experience. (68%) excellent, (29.1%) good, (1.9%) very good. (71.8%) First experience of donation. Motivations coded in 10 categories: (60%) excess of production, (40%) desire to help. Others: Being able to access to donated milk for their children, knowing the needs of the milk bank, etc.
2006 Fortaleza (Brazil)	Reasons for donation: breast engorgement. Knowledge of the milk bank. Prenatal and peripartum stage.
2007 Austin (EEUU)	Knowledge of the milk bank: (14%) Health care professionals, (28%) acquaintances, (17%) Website, (31%) Other. Motivations (scale 1-10). Helping others (9.34±1.34), excess of milk (8.44±2.56), Knowing the needs of the milk bank (7.79±2.74), Hope someone else will do the same for them if needed (7.79±2.74) Evaluation of lactation: (69%) Excellent (20%) Good Problems during lactation: (68%) Engorgement, (33%) dryness or cracks, (20%) Mastitis. EI 97% Will donate again
2008 Alagoas (Brasil)	Motivations for donation: (61.3%) Professional recommendation, (25.3%) social involvement, (7.3%) Knowing children that need breast milk.
2009 Londrina (Paraná) Brasil	Hospital of birth: Baby-Friendly Hospital (47.3%) Non Baby-Friendly Hospital (52.7%) Knowledge of the milk bank (37.4%) Healthcare system, (26.4%) Family environment, (27.5%) Motivation: (65.1%) Problems with breastfeeding, (39.4%) Interest in donating
2010 Brasil	Knowledge about procedures in the milk bank: (44.4%) Unaware, (33.3%) Uninformed (22.2%) Well informed. Information received. (44.4%) No information prior to birth. (25%) Prenatal period (16.7%) Prior to pregnancy. (66.7%) Knowledge of extraction and preservation procedures.

2.3. Results

Despite the fundamental role of donor mothers in the work process of milk Banks we've found only a few references that enable us to characterize the motivations of this women to perform the act of donation (compared to the high number of investigations on the analytical characteristics of the milk, its conservation, etc.). In this case, the studies were carried out in different locations (Nigeria, France, United States and mostly Brazil), and along a period of 25 years (1995-2010), which describe a variability in the socioeconomic characteristics of mothers (marital status, number of pregnancies, educational level, etc.) and motivations, allowing the analysis of common occurrences in them (Table 2 and Table 3).

Chronologically the first article we found is the one published in Nigeria in 1995 [15]; due to the high number of situations in which mothers cannot breastfeed the author proposes to assess the willingness of the mothers to donate their milk, to accept donated milk from other mothers (or from a milk bank) and nurse their children when they are HIV positive, the author interviewed 680 women attending the Jos University Hospital (JUH) administering a questionnaire. This study also aimed to know the attitude of healthcare professional (nurses and doctors) regarding the use of donated milk and determined that only 11% will use donated milk.

In 2003 was carried a study to understand the motivations and personal characteristic of women donors in France [16], it involved 103 women of eight milk banks who answered a questionnaire with thirteen items on the social characteristics of the donors and the information received. The authors conclude the importance of the partner support for the maintenance of the breastfeeding and the donation, noting the high number of female donors who do not work outside home compared to the national statistics. Regarding breastfeeding experience the vast majority saw it as good or excellent despite the existence of problems such as engorgement. Given the difficulty to find a consultant about breastfeeding, milk banks represent a benchmark for many mothers who have this problem. It is also important to note that the second reason was altruism. The authors suggest that the study results can be an advantage and provide guidance to recruit new donors since the presence of other donors may facilitate donations by improving communication and information to new ones. Protection services to breastfeeding should include milk banks as a service and healthcare professionals should encourage women who can be donors.

In Alagoas (Brazil) [17], in order to identify the factors that influence or motivate a donation, was made a cross-sectional study including 737 women collecting socio-demographic data with series of items regarding the motives and influences to become a donor. The authors measured the change in motivations of mothers since the introduction of the first milk banks in Brazil (economic motivations) to the present (altruistic donations), in which the mothers indicated that their motivation in their first donations had been the recommendation by a health-care professional followed by the needs of children using the service of milk banks, indicating the need to involve professionals in the promotion of donation including prenatal visits, training mothers about the process and

encouraging donations with the help of volunteers and the provision of technical means. The authors suggest that this information should be used as a basis for developing campaigns to search for new grants and maintain a regular level of donations; they also determined that the limitations of the study were the non-transferability of the results to other countries due to social and cultural differences, the inclusion in the statistical analysis of a small number of donors and the lack of studies in the literature with which to compare results.

On the other hand, the study made in the Federal District of Brazil [18] aims to describe the characteristics of the behavior on donations and describe the institutional and social support from women donors of the two milk banks in the public system of health care between May 2005 and November 2006. This is a descriptive study with structured and semi-structured interviews administered at home. The authors conclude from the results that a institutional care, encouragement and improvement of communication in the donation process, along with social support from people surrounding the donor, can strengthen the donor network. Another possibility is that these donors can give support and attract other donors in their environment disseminating information and motivation. At the same time, the work of some institutions training people in support groups can improve the quality of the network of milk banks following the recommendations of the female donors.

The study published in 2007 [19] highlights the importance of donors in the milk bank system, and poses as a main objective to obtain a complete and quantitative view of donors assessing demographic data, lifestyle characteristics, procedures related to participation in milk banks, reason and motivations for giving milk, barriers encountered when donating milk, affective experiences and personal values. Comparing donor mother to no donor mothers they found no significant differences regarding breastfeeding problems or lifestyles. Although not directly comparable, since the question was stated in another way, the data indicates that affectively the donation was more positive and produced less negative emotions than when there was only the act of breastfeeding. The study concludes that most donors are married, young, economically stable and healthy being the altruistic and charitable beliefs the motivations in the donation. They refer barriers to donation and difficulties with the extraction but find the experience positive and will donate again if possible.

In 2009 [20], it was performed a study to determine the socioeconomic profile of the donors in the Human Milk Bank in the University Hospital of Londrina in the state of Paraná (Brazil) through a cross-sectional study of 91 external donors who answered a questionnaire with both open and closed answers. They highlight the number of primiparous women between the donors; this may be related to the need of assurance of the mothers about the characteristics of their milk, its quantity and quality. While women with another child have lived through it before, primiparous women often seek help from professionals or from the milk bank and that enables the contact with the donations, which means that it shall be taken in account the importance as informants and recruiters of the healthcare professionals, it also is important determine the characteristics of the donors to

adapt the approach of informative campaigns to attract new donors.

In 2006 [21] arises in Fortaleza (Brazil) a qualitative cross-sectional study in order to determine the demographical characteristics and motivations of milk donors. The study sample was of 11 women recruited in the milk bank, the amount of participants was defined by the saturation of the samples. The selection criteria were women who donated milk spontaneously and agreed to participate in the study, excluding those who were donating milk for their own children. They used a semi-structured form that provided information about the characteristics of the women and included guiding questions that will allow the motivations avowed for donating milk to the milk bank. In order to interpret the information they analyzed the content which allowed the classification of different categories: the reason for starting to donate milk, knowledge of the existence of the milk bank, importance granted to the milk bank and natural milk. The qualitative analysis of the knowledge of the existence of the milk bank indicates that this information is acquired in the prenatal and postpartum periods. Similarly, it indicates the role played for the milk bank for the maintenance of breastfeeding through guidance to the mothers, both on its benefits and the right way to breastfeed. The authors indicate in the discussion the significant increase in the number of donations; however, it is important spreading the knowledge of the existence of the milk banks, emphasizing its characteristics and benefits to society.

2.4. Discussion

After the industrial revolution and the incorporations of women to the labor market and educational system occurs a change from a traditional natural aesthetics, motivating feeding with natural milk (preferably from the mother) built on values and feelings inspired by motherhood and family, to an industrial aesthetic initiator of artificial milk where the motivation was based on the values of professionalism and technologicism leading even to changes in the symbols and the art that express feelings belonging to a tendency characterized for a natural aesthetic: maternity feelings, breastfeeding as a crossroad with benefits for the child's health, the mother's health and the positive emotional effects both for the mother and the child [22]. Then there is a dialectical movement that denies traditional values limiting the role of women in society to a domestic caregiver, breeder, and feeder of the offspring in order to integrate women to the labor market and be able to devote enough time and effort to achieve professionalism [6]. Feminism, democracy and the welfare state in the mid-twentieth century promoted values of equality between men and women in which there were no motivations to motherhood and breastfeeding. After this two antithetical movements there is a synthesis promoted by the post-feminist movement by through which some women try to recue some values abandoned when faced with the needs of professionalization of women and more equal society for the purpose of gender differences. This reinterpretation of the role of women tries to reconcile motherhood with professionalism, but this involves a struggle for the professional to be recognized as mother and nurturer, at this historical moment a new typology of values arises resulting from synthesizing traditional and

new values: breastfeeding from the mother and natural breastfeeding with professionalism, technologicism and also humanism and transmaternal community solidarity [23].

At the same time changing the feeding habits has been accompanied throughout the twentieth century with proposals advocating the benefits of breastfeeding: Cicely Williams in 1993 attributed to the loss of exclusive breastfeeding an increase in the mortality and criticizes the misleading advertising of infant formulas [24]; elements of community participation as the "milk league" [25] and the establishment of health policies for the promotion of breastfeeding [26] have led to the adoption of measures to promote breastfeeding and the assumption of legislative changes in order to favor the rights of women and children to breastfeeding [27]. Currently the associations of Pediatrics indicate the advantages of breastfeeding over present and future conditions of the child and the mother, increasing the bonding between mother and child and assuming a benefit to society by reducing the consumption of health resources and health expenditure among others [28]. In the early 80's WHO and UNICEF established that the first alternative when the mother cannot breastfeed her own child should be using breast milk from other sources [29], this means that milk banks should be available in certain situations. The donations system established in the milk banks has been inspired by an institutional type of aesthetics that arises from the new needs generated by the incorporation of women to the labor market and the educational system and through a process of Community awareness that goes beyond the support of spontaneous and neighborhood networks of solidarity, being the key link maternal grants facilitated by an excess of milk and altruism that allow donors to go a step further in enhancing their self esteem and role as a woman and mother produced by breastfeeding [30].

It is hard to compare socio-demographic data from various articles due to a variety of reason but first of all this difficulty comes because the distinct social characteristics present in these countries. However, we observed variability in the age of the donors as well as the socio-economic status and educational level. We believe it would be appropriate to make an assessment of the sociodemographic characteristics of women donors depending on the socioeconomic characteristics of the population where they live.

In general as fundamental motivations in the studies stand out: excess milk production and altruistic motivations, which are favoured by a contact or acquaintance with the activities in the milk bank, being this a positive factor, as it is to maintaining the duration of breastfeeding the involvement of healthcare professionals in the process of information and training to mothers and the families both during prenatal and postpartum and that included a program of development and promotion of breastfeeding, which will involve a fundamental social support for initiation and maintenance of donation [31], [32]. This social support for women may be considered in the nursing process as a phenomenon that includes motivational aspects, promotion and protections of breastfeeding [33]. Other factors favouring grants are based on institutional involvement at both the information of the characteristic of milk banks and the establishment of support network, which may include the presence of

donors in the healthcare system as reference and the creation and maintenance of a collections system to prevent troubles and frequent trips to the milk banks to the mothers that want to donate their milk [34].

3. Conclusions

In this review we tried to know the motivations of the mothers to donate to milk banks nowadays. Even being fundamental factors the excess of milk and altruistic feelings, formation and information to health care professionals surrounding the birth process are key elements for detecting and maintaining new donors that must be accompanied by a collection infrastructure to provide the mothers some comfort at the time of the donation, having here a fundamental role the nurses as a key element of communication and attention at different stages of pregnancy, childbirth and breastfeeding.

Promoting donations, implied as a factor in the maintenance of breastfeeding, carrying out information campaigns in the media, should be accompanied by a characterization of donor mothers, not only on a socio-demographic data (given the large variability on the characteristics reflected in the studies), but also in terms of the qualitative aspects or motivation, enabling the means to reflect those characteristics to the mothers and channel the information.

On the other hand, these campaigns should be accompanied by information to the donors on the characteristics of donor milk that may act as a positive factor for the maintenance of lactation, and promote the collection and transport of milk to schools in order to avoid disturbing the mothers.

4. Statement of Competing Interests

The authors declare that they have no competing interests and they have not received funding.

The research was exempt from ethical approval.

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